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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/781,833	02/12/2001	Benjamin N. Eldridge	276440-4	8560

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EXAMINER
ALANKO, ANITA KAREN

ART UNIT	PAPER NUMBER
1765	11

DATE MAILED: 06/06/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/781,833	ELDRIDGE ET AL.	
	Examiner	Art Unit	
	Anita K Alanko	1765	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *4/21/03 election* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-67* is/are pending in the application.

4a) Of the above claim(s) *30-39 and 53-55* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-29,40-52 and 56-67* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) *5,7,8* .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

Election/Restrictions

Applicant's election without traverse of species 1-A, 2-E, 3-B in Paper No. 10 is acknowledged.

Applicant believes claims 1-17, 19, 22-29, 40-52, 56-67 read on the elected species. However, examiner has examined claims 1-29, 40-52 and 56-67. Claims 18 and 20-21 are directed to forming a seed layer, which is considered part of the elected electrolytic plating species, since plating uses seed layers, deposited by any manner. Also species 1-A is considered to read on using a stamping tool to form the molded surface, since the only other method described in the specification (1-B) is also the non-elected species. Claim 1 and any dependent claim that is not directed to the elected species are considered generic.

Specification

The disclosure is objected to because of the following informalities: on page 22, line 3, "substrate 42" should recite - - substrate 32 - - . Please clarify what "EDM" means on page 33, line 4.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

Claims 4, 7, 25 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. In claims 4 and 7, some of the members of the Markush group overlap, therefore it is unclear because the members should be mutually exclusive of each other. In claim

25, it is unclear whether a Markush group is claimed. It appears that the lines 5-6 should also recite - - . . . precursors including one selected from the group consisting of liquid phase. . . - -

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-29, 40-52, 56-67 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pedersen et al (WO 98/52224) in view of Vaganov (US 6,406,636 B1).

Pedersen discloses a method for forming a microelectronic spring structure, the method comprising:

depositing a layer of sacrificial material 220 over a substrate 202 (Fig.2D);

forming at least one molding surface in the sacrificial material (the process of patterning 220, page 13, line 18);

depositing a layer of resilient material 260 over the at least one molding surface of the sacrificial material (Fig.2G);

patterning the resilient material to define a spring structure 262-266 in the at least one molding surface (the patterning is simultaneous with the deposition step); and

removing at least a portion of the sacrificial material under the spring structure (Fig.2L, page 19, lines 31+).

The elected species, species 1-A, is drawn to the method of forming the molding surface by pressing a stamping tool. Pedersen does not disclose to use a stamping tool to pattern the sacricial material. Pedersen discloses to use conventional photolithographic techniques to pattern the sacrificial material, and thereby mold the sacrificial material. Vaganov teaches that useful, known, functionally equivalent techniques to etching (as is used in photolithographic techniques) is to use molding or stamping to form microprofiles in materials (col.13, lines 52-59, claim 8). It would have been obvious to one with ordinary skill in the art to use stamping to pattern the sacrificial material in the method of Pedersen because Vaganov teaches that this is a useful alternative and also functionally equivalent technique for patterning layers.

As to claim 2, as shown in Figure 2D, there is an opening in layer 220 to contact 208.

As to claims 3-4, Pedersen discloses that sacrifical materials under a spring contact structure may comprise a plurality of layers including photoresist, 220, 230 (Fig.2A-2E).

As to claim 5, the patterning in the method of Pedersen encompasses removing a selected portion of the sacrificial material from the substrate.

As to claims 6-8, Pedersen discloses to use photoresist, which comprises a curable material, and Pedersen discloses to pattern it, which encompasses forming recesses.

As to claims 9-11, Vaganov does not disclose the details of the molding or pressing step. However, it would have been obvious to one with ordinary skill in the art to cure the photoresist in the method of Pedersen in order to form a robust pattern that does not deform during subsequent processing, as taught as useful by Pedersen (page 16, lines 30-31). It would have

also been obvious to one with ordinary skill in the art to displace a portion of the curable material because pressing processes with tools conventionally do that.

As to claims 12-14, 40-42, Vaganov teaches that it is useful to also use a combination of etching and molding or stamping steps (col.13, lines 52-59). Anisotropic and isotropic etching are conventional etching techniques. Pedersen also teaches a useful range of exposed area which overlaps with the instantly claimed range (claim 41). It would have been obvious to one with ordinary skill in the art to include anisotropic or isotropic etching in the modified method of Pedersen because Vaganov teaches that a combination of steps can be used for microprofiling, for which a combination of anisotropic or isotropic etching and stamping is obvious in order to precisely form a molding surface.

As to claim 15, Pedersen discloses to deposit a mass of metallic material 230 (page 15, lines 18-19) over the at least one molding surface.

As to claim 16, Pedersen discloses to deposit through a stencil or shadow mask 240.

As to claims 17-24, Pedersen discloses to deposit a seed layer 250 (page 16, lines 20+, claims 19-21).

As to claims 25-29, Pedersen discloses to use electrolytic plating (Fig.2G) to deposit a at least one of the metallic layers.

As to claim 43, examiner takes official notice that treating polymers with a plasma to render it electrically conductive is conventional. It would have been obvious to treat the sacrificial material polymer with a plasma to render it electrically conductive because it is a useful technique for forming conductive layers.

As to claim 44, Pedersen discloses to contour perpendicular to the substrate by layer 230.

As to claims 44-52, Pedersen discloses various contours which would be useful for the contacts 2I-2O, 6A-6B,7).

As to claims 56-67, the cited pressing and deposition steps are well known patterning techniques which would be obvious to use in the modified method of Pedersen to form a desired contour.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The cited art shows methods of sacrifical etching or molding.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Anita K Alanko whose telephone number is 703-305-7708. The examiner can normally be reached on Monday-Wednesday and Friday, 8:00 am-4:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Benjamin L Utech can be reached on 703-308-3836. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9310 for regular communications and 703-872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.

Anita K. Alanko

Anita K Alanko
Primary Examiner
Art Unit 1765

AKA
June 2, 2003